#### Comments submitted for Ruekert Mielke's NE Neighborhood Plan and Draft Conceptual Stormwater Study July 12, 2007

Terry Carpenter, Fitchburg

Also allocki Also allocki Rear ki Part of these remarks appeared in my Letter to the Editor of the Fitchburg Star this week. But I've clarified some points and added several pertaining to the Stormwater Study.

#### **RE: The Neighborhood Plan**

The new Ruekert-Mielke Neighborhood Plan for the Northeast Neighborhood (NEN) is flawed in many ways including its name. A "plan" should create a vision of what you want to see happen, not just assume that trends of the past will continue to be the trends of the future, and then figure how to accommodate those trends.

As one example, take this quote from page 11 of the plan:

"The convenience of US Highway 14 will only be enhanced with the addition of the planned interchange at the western edge of the neighborhood, increasing the appeal of the area as a residential location for workers who are employed elsewhere in the Madison metropolitan area."

Is it the job of the city of Fitchburg to encourage more automobile traffic at a time when global climate change is running amok? Half the country is suffering a drought. The West is experiencing triple digit temperatures. Tropical diseases like West Nile Virus are spreading northwards. And you're your company is enthused about creating a new, car-centered development on farmland. This doesn't make sense.

Yes, an interchange would make driving from the NEN more convenient, which is precisely why the city should be discouraging it and encouraging mass transit instead. What if they took the \$8 million that they'd have to spend on that interchange and put it into rail, buses or other more efficient transit? I realize that the interchange is planned as part of Greentech Village but I don't see how adding an interchange contributes to the green in Greentech. Rail or other mass transit is green, highways are not. So, if this interchange can be avoided, it should be. And then where does that leave the Northeast Neighborhood with all that traffic on MM and the now quiet country roads to the east.

I hope our city government will wake up to its responsibility to make changes that will slow global warming before it's too late. We are responsible for what we leave our children and grandchildren. And we need to start now on crucial and authentic planning that takes new realities into account.

#### **RE: Stormwater Study**

Many of the recommendations show an attitude that I think is at best arrogant and at worst dangerous. There is a constant mantra to strive for something with less impact than row crop agriculture. This attitude does nothing to acknowledge the problems created historically by this type of agricultural practice and it ignores the fact that much of the Northeast Neighborhood is not planted with row crops but includes woods, fields, etc. that are not plowed up every year. In addition, some of the proposed area would consist of unknown businesses which could provide an impact you haven't factored into the equation. So, the entire area would not be converted from row crops to row houses. Thus, looking at lower TSS runoff than bare land in winter should not be the measure for responsible development.

And along the same lines, the degraded wetlands are just as important to the area as identified and protected wetlands. In fact, degraded wetlands are possibly more important because restoring them could help improve the situation. So, shouldn't the standard be to restore all degraded wetlands and buffer them to improve water quality? How long can we continue to degrade water quality?

You also advocate degrading water quality by only eliminating 80% of the pollution (TSS) created by the development. Why is it ok to pollute at all? What does this do to our habitat over the next decade or the next century and beyond?

I recently learned that the levels of phosphorus required to kill (through eutrophication) Lake Waubesa are miniscule. In fact, the amount, according to Dr. Cal DeWitt's calculations, could be carried by a single pickup truck. This is an amazing piece of information that we cannot ignore. Although there may be differing statistics about how much phosphorus runoff is produced by houses or agriculture, we must start reducing this amount instead of thinking that we can continue as we have been or worse yet ignore the problem and increase the levels.

And, as I'm sure you are aware, stormwater management does NOT address nutrients like phosphorus. Since farmers test their land before applying expensive nutrients to it, it is quite likely (and some studies show) that lawns will apply much more phosphorus than existing farms do. Again, we can't use the current, destructive levels as a guideline for new development. It is short-sighted to keep sending vast amounts of phosphorus into our water systems. And planning to do so is even more reckless than continuing with current practices.

Not knowing how over 1400 new dwelling units will impact the groundwater is not acceptable. If you don't know, you should not take a chance on depriving others of their right to have an adequate supply of clean, affordable water. And you should not take a chance on shutting off the springs that are needed to refresh the southern end of Lake Waubesa.

As you acknowledge, recharge and infiltration are different things. And since you don't know what recharges the springs at Nine-Springs Creek, it is irresponsible to strive for a 7.6 per year recharge without knowing how or where to do it.

#### Summary

There are many, many reasons not to develop according to the typical residential/office/retail plan that you've created for the Northeast Neighborhood. There are several other options for this land that: bring needed education and implementation of local food systems into the area; improve runoff problems by restoring and buffering degraded wetlands identified by a UW class study in 2006; and promote small-scale farming so that Fitchburg's future includes a major farming component. Fitchburg doesn't need more houses miles away from its city core. The 2007 Business and Community Guide lists only 4 businesses under Agriculture. While there are a few more that aren't listed, there is a shortage of locally grown food. The best and highest use of this land is a combination of small-scale agriculture, wetlands and parks or other low impact use that blends with its surroundings and not only protects but also improves the quality of water, and therefore life, in the entire area.

Sincerely,

Terry Carpenter 2341 Gold Drive Fitchburg, WI 53711 terryc@gcmicro.com

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Fritchburg bkaniewski@ruekert-n	nielke.com

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Name: Pon Larson Address: 4757 Goodland Park Road	please contact Bruce Kaniewski at
Madison 53711	bkaniewski@ruekert-mielke.com
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James ANG Shekker Jane  Fitchburg	If you have any other questions or comments please contact Bruce Kaniewski at bkaniewski@ruekert-mielke.com
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This is an environmentally sensitive area. Obviously, I am opposed to the kinds of business & residential development that is proposed.

----Original Message----

**From:** Melanie McIntosh [mailto:mcintoshmelanie@msn.com]

**Sent:** Wednesday, July 11, 2007 11:12 AM

To: Kaniewski, Bruce

Subject: Land Use Planning Meeting Input

I am unable to attend the meeting so I want to submit my testimony in writing.

My name is Melanie McIntosh and I am a resident of Fitchburg's Hatchery Hill neighborhood. I have been following the issues involved in Fitchburg's urge to develop outwardly, especially in the eastern direction. Sprawl is a problem most everywhere and it is a problem here as well. Water resources are challenged by the pressures of development and other quality issues most everywhere and they are challenged here as well. Farmland is disappearing most everywhere and it is disappearing here as well.

What is wrong with city and land use planning processes that they don't favor the preservation of natural resources and farmland? Why won't we stand up and initiate new planning processes such as have been adapted in Ashland, Wisconsin and some other communities? Perhaps there isn't the knowledge level on Fitchburg's City Council to be able to move toward such planning processes?

It baffles me that the majority of Fitchburg officials seem to be able to place economic development as paramount over preservation of land to grow food and over water to fulfill basic needs. Even if the aesthetic and moral aspects of preserving nature are set aside, and it seems that they are frequently set aside in this land use planning process, then how do Fitchburg officials square with the idea of no holds bar development of farmland?

And how do Fitchburg officials stand up for a process that puts at risk one of the lakes and wetland areas that make Dane County such a great area to live in? Perhaps it is a problem of putting other community's resources at risk not our own? Hopefully not. Perhaps it is that developers make great neighbors and community leaders? Hopefully not. Or that they are men relating well to the men of the council? Let's hope that isn't the reason. As you can see, I don't understand the dynamics involved in such indulgent approaches to development and the conversion of farmland to more residential developments. It seems the mayor and a few other Council members are impatient when it comes to the discussions of land use and natural resources. I watched part of the testimony on local access television and I learned how impatient the council is with public testimony.

I was attracted to Fitchburg because of the leadership it showed in recycling. I thought it was a community committed to sustainability of natural resources. Was I mistaken?

Please register my view that residential developments should be limited to the areas nearer to Fish Hatchery Road. Please don't allow unlimited development in the city's northeast area.

Thank you for this opportunity to share my opinion,

Melanie McIntosh 608-217-4364 ----Original Message----

From: emma czarapata [mailto:keepintouch54162@yahoo.com]

Sent: Wednesday, July 11, 2007 12:22 PM

To: Kaniewski, Bruce

Subject: developing Northeast neighborhood

I am writing about the plan to develop the Northeast neighborhood. There are lots of reasons to rethink jumping so far away from Fitchburg to plan such dense housing. I will concentrate on a couple:

It will cost a lot for the infrastructure needed to build houses. Fitchburg residents will pay for that. What about added fire and police protection? There is a cost for that. Since people in this neighborhood will probably shop in Madison or Monona, taxpayers in Fitchburg would not be benefiting from this neighborhood after they pay for costly roads, sewer and water infrastructure. Money would not stay in Fitchburg. Economically, it would be an overall drain for Fitchburg.

We need to look at the big picture to see if developing so much land is necessary. What happens if development continues it's present trend and there is little or no demand for houses. Madison is seeing unsold condos and a buyers market with houses staying on the market a long time. Often they are finally sold with much accommodation from the sellers. Oregon has a moratorium on putting in roads because of a lack of home building. Why would this area be any different?

This area is close to the E-way and houses lots of animals. Where will they go? We are constantly encroaching on their living space. It makes sense to leave this wild.

There are other alternatives. Already, the Hmong association has rented land for gardens. What if they were to use the land already tilled, plus encouraging more gardening? What if other organizations would rent some land for gardens. It would help the economy of Fitchburg. I could see vegetable farmers selling goods at the Fitchburg farmer's market and buying supplies there.

Thank you for your time,

Emma Czarapata 3106 Larsen Rd Madison, WI 53711 223-0802 Dear members of the Fitchburg Common Council and Plan Commission:

As a former trustee for the Village of Oregon, I saw mounting evidence two years ago that building activity in Oregon would soon begin to decrease. Building permits have since tanked, 619 lots stand empty, and the growing surplus of unsold homes is inflicting more and more pain on sellers. Meanwhile our Village must maintain a good deal of little-used new infrastructure. In May, the newly-seated board very wisely approved a one-year moratorium on residential annexation. Given larger trends in our nation and the world, it is likely this moratorium will be extended for many years.

A moratorium might not suit Fitchburg at this time, but it is also clear that the Northeast Neighborhood lies well beyond Fitchburg's active growth areas. Since development in the Swan Creek neighborhood is slowing (nothing appears to be happening in the vacant mixed-use blocks near the east end of Cheryl Parkway, for example), it may even be premature to forge ahead with Green Tech Village. Proceeding with the Northeast Neighborhood BEFORE Green Tech is well underway would be Dumb Growth indeed!

Nor should the Northeast Neighborhood be used as an excuse to construct a costly new interchange on Highway 14 and thereby make Green Tech viable. Fitchburg taxpayers would pay for this interchange one way or another; thus Green Tech must stand or fall on it's merits - especially its advertised New Urban features densely clustered around a planned rail transit stop. And proposing a cutting-edge "green" development with the caveat that a major new highway interchange must serve as midwife is disingenuous at best and rash at worst. If Green Tech becomes yet another iteration of divided highway sprawl - albeit one with motorist-unfriendly urban features - the result will be neither fish nor fowl. It will flounder and die, even if the Happy Motoring Utopia should persist a bit longer.

Fitchburg leaders will do Northeast Neighborhood developers a big favor by ceasing to indulge their expectations. "Just say 'No!'" applies no less to risky development than to risky sex!

There are other compelling reasons to reject a future of endless lateral expansion. We-the-people must face the "inconvenient truth" that most of our communities are already too sprawled out: that is why we find so many reasons to avoid fighting our unsustainable twin addictions to cars and petroleum. Infill represents not merely an enlightened alternative to lateral growth; physical realities like finite oil and global warming may soon make infill our ONLY alternative. Far from expanding, we may find it necessary to CONTRACT our cities and villages - which means many non-farming residents of exurbia and the far reaches of low-density suburbia will abandon these locals for pedestrian-oriented neighborhoods. These are profoundly wrenching transformations to contemplate, but far better than continuing to spill untold blood and treasure in an ultimately futile struggle to secure foreign energy supplies and other resources to feed our automobiles.

Sincerely,

Hans Noeldner Oregon, Wisconsin Dear members of the Fitchburg Common Council and Plan Commission:

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# City of Fitchburg - Northeast Neighborhood Plan Comment Form

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# Comments submitted for Ruekert Mielke's Draft Conceptual Stormwater Study July 12, 2007 By Rosanne Lindsay, resident Fitchburg

The city of Fitchburg recently received a *Draft Conceptual Storm Water Study* which, if approved, would attempt to mitigate runoff pollution from a proposed development in the Northeast Neighborhood. I reviewed this draft Stormwater study using current statutes and recent published studies to determine whether it could be implemented to protect the natural resources and the public health.

#### Additional Studies Recommended

The authors of this plan state, "The Northeast Neighborhood planning area and surrounding properties have significant natural resource features that require protection." They further recommend additional studies prior to development which "would include a more detailed evaluation of how the proposed development would affect the groundwater system, including storm water recharge, water quality and spring flow protection."

To the authors' credit, the plan area is indeed situated near a natural treasure in Dane County. The area is home to woodlands, wetlands, hydric soils (historic wetlands), Big Fen, Murphy and Swan Creeks, Deep Spring, and Lake Waubesa. Thus, I encourage the city to await results from several ongoing studies that will evaluate many of the stated concerns.

Spring flow protection is relevant because Deep Spring helps freshen the lower twothirds of Lake Waubesa, and depends on adequate groundwater flow and recharge. Wisconsin has taken steps to protect springs under (2003 WI Act 310, p.2); and the Wisconsin Department of Natural Resources is now charged with evaluating whether groundwater pumping by new high-capacity wells will impact these springs.

A groundwater study should also be conducted. In Dane County, large water withdrawals from the aquifer and the diversion of about 50 million gallons per day to Badfish Creek results in a net deficit to our aquifer. Waukesha, New Berlin, and Green Bay are examples of cities that have depleted their clean groundwater and will spend tens of millions of dollars to clean the contaminated water that's left or find a new source.

Water levels in the region have dropped enough that the computer model used to calculate the impacts of new wells on the aquifer and surface water in Dane County will need to be updated before future decisions on groundwater use are made, according the model's author, hydrologist Ken Bradbury.

Additional research, including a graphic model of key hydrologic interactions of the study area, is also being conducted by UW scientist and world renowned wetlands expert, Professor Cal DeWitt.

#### No Implementation Plan

According to the authors, the purpose of this stormwater plan is "to provide directions and standards" to reduce runoff pollution resulting from development, avoid the creation of future problems, and protect natural resources, using seven goals. However, the plan also states that "no recommendations on how or where storm water management measures will be implemented are included as part of this report."

A plan based on "goals" without specifying enforceable measures to meet those goals cannot ensure that pubic health and natural resources in the area will be protected.

For example, the goal to "preserve and reproduce existing hydrologic conditions," by itself, represents a major challenge to the city. In simple terms, the "hydrology" of a watershed is dependent on two main criteria: adequate surface flow which feeds both spring flow and the lake, and adequate infiltration for groundwater recharge. Changing either criteria, even by small amounts, can alter existing hydrology. So the real question becomes can infiltration and groundwater recharge be preserved?

#### Inadequate Measures for Groundwater Recharge

The 2005 Dane County Water Body Classification Study showed that even low levels of development upland from a watershed will impact and often degrade the hydrology and predictability of the water system. In fact, the County recently revised its stormwater ordinance (Ch 14) to replace caps on maximum land area required for infiltration. New language aims to maintain pre-development groundwater recharge through new design practices and flexibility to the developer.

However, groundwater recharge rates are highly difficult to measure directly or to estimate accurately, and vary with geologic conditions, land use, soil class, and changes in precipitation. Without a specific site evaluation, it would be hard to determine what standards are needed to protect or improve upon the water quality, groundwater supply, or flood protection for this area. Neither the State Code (NR 151) nor County standards are "resource based" (watershed specific).

Moreover, would existing models allow developers the flexibility to develop new approaches to improve infiltration at the site when specific site data is lacking? This question further demonstrates the need to wait for site-specific research.

Finally, this study makes no requirements for testing, monitoring, inventorying, or reporting infiltration amounts. There are no funding resources at the County to capture and maintain these inventories and there are limited resources at the city level. How will the city verify that any implementation of stormwater controls meets the original goal?

#### Pollution Standards Lacking

According to a 2002 EPA Water report, pollution from runoff during and after rainfalls is now the single largest cause of water pollution. A 2006 EPA Report shows 40% of streams to be in poor condition due to increased sediments. This suggests current protections under the State and County Stormwater Management Standards do not necessarily guarantee the protection of public health and safety or the natural resources in the plan area.

#### Conceptual Study Insufficient

This study is only a concept. Each goal that might be implemented omits an objective assessment of efficacy. It is impossible to evaluate what the outcome might be with respect to probable percent reduction in stormwater runoff and erosion, even if all of the suggested measures were employed in response to development in the Northeast Neighborhood Plan area. Therefore, the city should not use this study as a means to approve any neighborhood development plan, any growth boundary, or any extension of urban services.

Recently, a newly formed regional planning body was created by Governor Doyle. The Capital Area Regional Planning Commission (CARPC), charged with planning growth and protecting the county's water resources, should be able to further study this issue and the aforementioned ongoing studies to determine whether this plan, and others submitted, merits extension of Urban Services to develop the environmentally sensitive Northeast corner of Fitchburg.

A version of these comments was published in the June 28, 2007 issue of the Fitchburg Star.

#### Additional comments:

- 1) The level of protection specified under Stormwater Management Standards (Appendix A), does <u>not</u> guarantee the protection of public health and safety. One need only look to the best management practices (BMPs) used in Waukesha (the home site of Ruekert Mielke), to see that the public health protection is not guaranteed. Radium levels in drinking-water, there, remain over federal drinking water standards.
- 2) Where are the study elements for protecting Wetlands? This study merely pays lip service to the wetlands located to the south (Waubesa) and north (Nine Springs) but does nothing to ensure their protection. Any real stormwater plan must include the protection of the wetlands as part of the special, natural, integral features of this area. (See p. 41of Dane County Water Body Classification Study):

- "- Since wetlands are degraded by the same processes that affect streams and lakes and greatly contribute to their overall health and well-being, they too should be afforded the same level of protection and emphasis.
- Even wetlands smaller than 2 acres play important roles, individually and cumulatively. Protection should be based on field delineation, working around these areas or incorporating them into the design.
- Prior-converted wetlands and others that have been ditched or drained should be restored and enhanced."
- 3) Further studies related to development in the NEN should be conducted including:
- 1) A groundwater (hydro-geologic) study of the aquifer in the NEN showing the effects of development from increased well pumping.
- 2) Cost of Community Services Study related to costs of development (i.e, water, sewer, and new roads and interchanges), that are passed on to the community. Virtually all of these cost studies show that residential land is a net drain on local government budgets and that it brings costs to the community that are not fully borne by the new residents but are instead distributed throughout the community. Findings show that for every dollar collected in taxes and non-tax revenue, between \$1.15 and \$1.50 must be spent in the form of local government services. (see study from the Town of Holland in La Crosse, WI: <a href="http://www.co.la-crosse.wi.us/TownOfHolland/Docs/COCSreport.pdf">http://www.co.la-crosse.wi.us/TownOfHolland/Docs/COCSreport.pdf</a> and this study from the towns of Dunn, Perry and Westport <a href="http://www.pats.wisc.edu/abscost.htm">http://www.pats.wisc.edu/abscost.htm</a>).

In fact, proponents of farmland and open space preservation now have an important economic argument on their side.

3) Transportation Study showing the impacts of traffic flow and increases in traffic and pollution to the area.

Thank you for the opportunity to submit my comments.

Sincerely,

Rosanne Lindsay 5771 Ballina Parkway Fitchburg, WI 53711



## The Effects of Large-Scale Pumping and Diversion on the Water Resources of Dane County, Wisconsin

#### Introduction

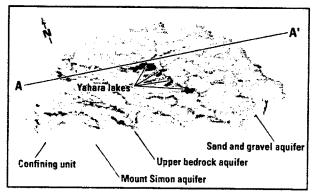
Throughout many parts of the U.S., there is growing concern over the effects of rapid urban growth and development on water resources. Groundwater and surface-water systems (which comprise the hydrologic system) are linked in much of Wisconsin, and ground water can be utilized both for drinking water and as a source of water for sustaining lakes, streams, springs, and wetlands. Ground water is important for surface-water systems because it commonly has greater dissolved solids and more acid-neutralizing capacity than surface water or precipitation. The supplies of ground water are finite, however, and, in many cases ground water used for one purpose cannot be used for another. Moreover, ground-water use and withdrawal patterns may not be easy to alter once established. Thus, urban and rural planners are faced with decisions that balance the need for groundwater withdrawals while maintaining the quantity and quality of ground water for sustaining surface-water resources. Science-based information on the ground-water system and the connections to surface-water systems provides valuable insight for such decisions.



#### Dane County hydrologic setting

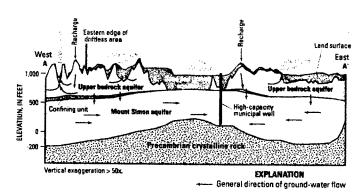
Bradbury and others (1999) describe the geologic and hydrogeologic setting for Dane County; a brief overview of this work is described here. Three aquifers and one confining unit underlie the Dane County area as shown in the block diagram (below). A shallow sand and gravel aquifer is made up of glacial and alluvial materials overlying the bedrock. Except

in narrow alluvial valleys, the sand and gravel aquifer is thin or absent in western Dane County (called the "driftless area"). The upper bedrock aquifer underlies the unlithified deposits and overlies the Eau Claire Formation. The upper bedrock aquifer is made up of Cambrian sandstone and dolomite. A shale, which is part of the Eau Claire Formation, forms a confining unit at the base of the upper bedrock aquifer. This confining unit largely is absent in the pre-glacially croded valleys of the Yahara lakes area and northeastern Dane County. Beneath the confining unit, a lower bedrock aquifer (the Mount Simon aquifer) overlies Precambrian crystalline basement rock. The Precambrian crystalline basement rock is assumed to be impermeable and forms the lower boundary of the ground-water-flow system.



Block diagram showing the model domain and hydrostratigraphy used in the Dane County Regional Model. Much of the geologic detail is consolidated into three major aquifers and one confining unit.

The regional hydrologic system in Dane County, Wisconsin, illustrates the effects of pumping and diversion on ground- and surface-water resources. Ground-water withdrawals from pumping average around 50 million gallons per day in the county, and ground water is the sole drinkingwater supply for county residents. Large-scale pumping there quantities pumped from wells distributed over a large area) is concentrated around the Madison metropolitan area and the Yahara lakes. Away from these pumping centers, ground water sustains lakes, streams, and wetlands, including important trout streams such as Black Earth Creek located in western Dane County. In an effort to improve the water quality of the Yahara lakes, the wastewater associated with the pumping is not returned to the areas where it was pumped but is diverted 9 miles south of the city of Madison. The pumping captures ground water that would normally discharge to the lakes: the diversion reintroduces the water far enough downstream that it does not re-enter the hydrologic system near the lakes. Dane County recently has had tremendous growth, and there is concern that the additional ground-water withdrawals needed to supply the larger population will adversely affect water-dependent ecosystems that are important for the local quality of life.



West-East cross section showing the upper aquifers and the lower (Mount Simon) aquifer. Schematic flow-lines also are included to illustrate the local and regional ground-water flow that occurs in the county.

Precipitation-derived water enters the ground-water system as recharge to the water table. This recharge takes place primarily in upland areas throughout Dane County. Rates of recharge are variable because of differing soil percolation rates, slope, and relative position in the landscape. As shown in the cross section, local ground-water systems with short flow paths are common in the sand and gravel and upper bedrock aquifers; regional flow with longer flow paths are present in the Mount Simon aquifer. Some of the recharging water may move downward to the sand and gravel or upper bedrock aquifers, travel a short horizontal distance, and then move upward to discharge in surface waters and wetlands. A relatively small portion of this recharge moves downward through the confining unit and into the Mount Simon aquifer. Because of the conductive nature of the Mount Simon aquifer and the presence of the nearly impermeable Precambrian rock, flow paths in the aquifer primarily are horizontal. Pumping wells extract water from both the Mount Simon and the overlying bedrock aquifer; this pumping captures a portion of the ground water that discharged to area lakes, streams, springs, and wetlands under pre-development conditions. In places where large withdrawals of ground water occur, streams and lakes may recharge the ground-water system.

In order to improve the understanding of the hydrologic system and the effects of increased ground-water use, a Dane County Regional Hydrologic Study was initiated. The study was a cooperative effort among the Dane County Regional Planning Commission, the Wisconsin Geological and National History Survey, and the U.S. Geological Survey. The study included the development of a regional ground-water flow model, which helps managers make informed water-resources decisions on an ongoing basis. The model helped identify major areas of ground-water recharge and discharge, estimate the amount of ground water discharging to surfacewater bodies, and simulate ground-water flow direction and rates. Once the model was developed, it was used for assessing effects of future groundwater withdrawals and the effects of proposed water-management programs. The initial model was completed in 1995 and has been updated annually to incorporate current conditions and updated modeling codes and procedures. The purpose of this Fact Sheet is to describe how the model was developed and used.

#### How ground-water flow models work

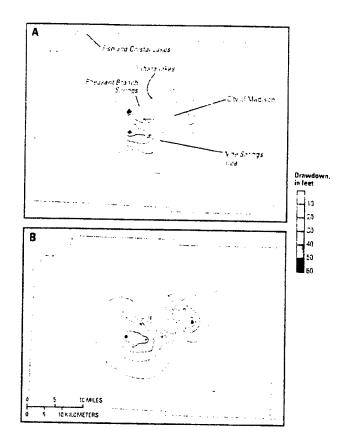
Understanding the ground-water-flow system can be difficult, so investigators commonly use mathematical models to simulate a simplified version of the system using computers. The computer code relies on two basic principles to perform simulations. The first is that water flows "downhill," or more exactly, from high potential to low potential. The second principle is that water cannot be created or destroyed; thus, what flows into the ground-water system must either flow out or be stored. Changes in storage are identified by changes in water levels within the system. Using these principles, as well as site geology and locations of streams and lakes in the area being studied, the hydrologic system is simplified and represented in a mathematical model. It should be noted that, whereas seemingly simple in principle and operation, ground-water modeling can be complex because of uncertainty in important model inputs such as properties of the material in the subsurface and timing of water additions and subtractions.

#### Model calibration

The ground-water flow model for the Dane County area was developed using the computer program MODFLOW (McDonald and Harbaugh, 1988). The model inputs included such variables as the amount of rain and snow that enters the ground-water system (that is, the amount of precipitation minus the amount of runoff to streams and the amount removed by evaporation and plant uptake). In addition, the locations of large wells, streams, and lakes in Dane County were entered into the model. The model was calibrated using 1992 pumping rates, and simulated ground-water levels and flows to or from the streams were compared to the ground-water levels and flows measured in the study area. Using a trial-and-error



Condition will face-water fratures can be infected by ground-water bumping. One such mature is the Pheasant Branch spring shown above.



Figures 1a and 1b. Simulated drawdown from pre-development conditions in the upper bedrock (fig. 1a) and Mount Simon (fig. 1b) aquifers resulting from high-capacity pumping at typical 1992 discharge rates. The Yahara lakes supply water to the wells, which splits the drawdown into two distinct cones of depression. Contour interval is 10 feet.

approach, the various model inputs were varied until model-simulated levels and flow approximated measured values. Measured-to-simulated ground-water levels from over 3.000 wells and measured-to-simulated flows in 13 streams were compared during the model calibration process.

## Model results: comparison of pre-development conditions to current conditions

Pre-development conditions were simulated by removing the pumping wells from the calibrated base model. This resulted in a representation of the hydrologic system before development that can be compared to current conditions to assess the effects of pumping on water resources.

As shown by contouring the simulated drawdown (the amount of water-level decline from predevelopment conditions caused by the pumping), the greatest effect of pumping on water levels results in the Madison metropolitan area. Shallow and deep ground-water levels in the vicinity of Madison declined more than 60 feet (fig. 1a and 1b). The largest declines are at the centers of two cones of depression that are split by the Madison lakes. Directly adjacent to and beneath these lakes there is no simulated drawdown of the water table and only about 10 feet of drawdown simulated in the Mt. Simon aquifer. Two distinct cones of depression indicate that these lakes are important sources of water to the pumping wells. This result is expected because the confining unit is absent or thin in this area and the aquifers are in good hydraulic connection with the takes.

It is interesting to note that prior to the large-scale pumping and diversion associated with development, the lakes and wetlands within the Madison area primarily received ground water. These lakes and wetlands primarily lose water to the or and-water system as a task of present-day pumping and diversion (fig. 2). Moreover, the largest area of the ground

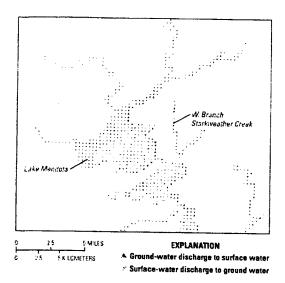


Figure 2. Model results showing the effects that pumping and diversion have had on the ground-water/surface-water interaction. During pre-development conditions, ground water would have flowed to the lakes, streams, and wetlands in the modeled area. Under 1992 conditions shown here, the lakes and streams lose water to the ground-water system (red triangles) in areas where development (and associated pumping and diversion) are concentrated.

water currently is discharging to a lake (the northwestern side of Lake Mendota) is relatively undeveloped. Because ground water is the sole source of drinking water for the county, additional pumping and diversion associated with future development in this undeveloped area could create a condition where Lake Mendota is losing water to the ground-water system on all sides. Such a change in the sources of water to the lake could affect the lake-water quality, food-web dynamics, and fish community.

The model also can be used to compare simulated pre-development baseflows to simulated current baseflows. It is apparent that pumping has reduced baseflow in streams (see table 1). That is, the current pumping and diversion near the city of Madison captures ground water that would contribute flow to these streams under pre-development conditions. The amount of baseflow decrease depends on how close to the pumping centers

**Table 1.** Comparison of pre-development and current conditions simulated baseflows in selected Dane County, Wisconsin streams

One in a section	Simulated baseflow <sup>1</sup> , in cubic feet per second	
Gaging station name	Pre- development	Current
Black Earth Creek at USGS gage above Black Earth	14.5	13.1
Badger Mill Creek at STH 69 south of Verona	2.0	0.6
E. Branch Starkweather Creek at Milwaukee St.	2.2	0.9
Koshkonong Creek at Bailey Rd. near Sun Prairie	0.6	0.1
Koshkonong Creek at Hoopen Rd. near Rockdale	36.4	33.8
Maunesha River south of USH 151	12.3	11.9
Mt. Vernon Creek at USGS Gage	2.4	2.1
Murphy (Wingra) Creek at Beld St.	3.4	1.3
Nine Springs at Hwy. 14	4.9	2.2
Pheasant Branch Creek at USH 12 at Middleton	2.7	1.2
Six Mile Creek at Mill Rd. near Waunakee	5.0	4.3
Token Creek at USH 51	13.0	10.6
W. Branch Starkweather Creek at Milwaukee St.	2.8	0.0
W. Branch Sugar River at STH 92 near Mt. Vernon	5.6	5.3
Yahara River at Golf Course near Windsor	8.8	8.0

Baseflow is the part of streamflow because of ground water discharging to the stream.

the stream is located. In one extreme case (W. Branch Starkweather Creek—see table 1), the stream is simulated as being dry for much of its length because of pumping and diversion. In reality, the stream flows during storm events but typically is dry during non-storm periods.

## Finding the contributing areas for drinking-water wells

Once the model is completed it can be used to trace mathematical water particles to determine where the ground water goes (if we track forward in time) or where it came from (if we track backward in time). This approach was used to simulate the area that supplies ground water to wells (called contributing areas). Model simulations indicate that, for the longest flow paths, it can take many thousands of years for ground water to move from the area where it enters the ground to where it discharges to a well, stream, or lake. Particles were tracked backwards from each municipal well located in Dane County. The resulting contributing areas (fig. 3) illustrate that the source for ground water withdrawn by municipal wells in Dane County lies entirely within the county boundaries for almost every well.

#### **Evaluating pumping scenarios**

The model also can be used to evaluate the effects of different pumping scenarios on ground-water availability and their effect on water resources. The model developed for Dane County demonstrated that an adequate drinking-water supply is available for Dane County if no other uses for the ground-water resources are included. Model results also demonstrated that, depending on the distribution and rate of withdrawal of proposed and existing wells, water quality may be affected, wetlands may be lost, and baseflow in streams may be reduced substantially.

Two scenarios were simulated with the model based on water-use projections for the year 2020 (DCRPC, 1997). The scenarios are: 1) the central 50 percent of Madison municipal wells (inner ring of red dots in fig. 4) provide 75 percent of the daily water demand and the outer 50 percent of wells (outer ring of yellow dots in fig. 4) provide 25 percent, and 2) the central 50 percent of Madison wells provide 25 percent of the daily water demand and the outer 50 percent provide 75 percent. By providing the majority of water from the central wells (scenario 1), the major sources of water for the wells are lakes and wetlands near Madison; baseflows in rural

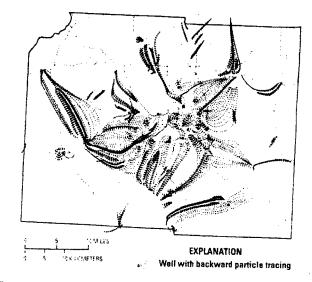


Figure 3. The areas that contribute water to the each municipal well in the county are simulated using backward particle-tracking (from the well to the recharge area) within the modeled system. The long particle paths represent a time of travel from the recharge area to the well on the order of thousands of years.

county streams are only slightly affected. Scenario 2 indicates that the wells would capture water that normally would flow to area wetlands and streams rather than removing water from the lakes. This result is demonstrated by the increased drawdown from 1992 conditions for scenario 2 (fig. 4b). The additional drawdown in the water table for scenario 2 is much greater than scenario I, indicating that scenario 2 would have the greatest adverse effect on wetlands and streams in the county. These scenarios are for illustrative purposes only and do not account for the feasibility teconomic, political, or other considerations) of implementing any particular pumping strategy. Such considerations would have to also be taken into account to fully assess the practicability of different strategies.

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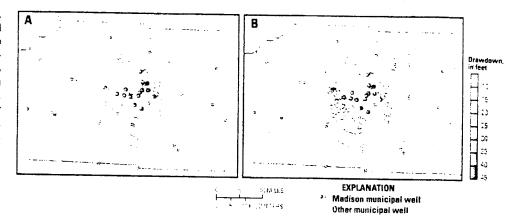
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McDonald, M.G., and Harbaugh, A.W., 1988, A modular three-dimensional finite-difference ground-water flow model: U.S. Geological Survey Techniques of Water-Resources Investiga-Cons. book o. chap. A1, 586 p.

Stoner, E.L. and Hunt, R.L. 2001. Use of a water-bed-mo-felling approach to assess hydrologic effects of urbanization. North Fork Pheasant Branch Basin near Middleton. Wisconsin: U.S. Geological Survey Water-Rosources Investigations Report 01-4113, 49 p.



Figures 4a and 4b. The model can be used to simulate changes in the hydrologic system for a selected management scenario. In this example, the Madison municipal wells are divided into an inner ring (red dots) and outer ring (yellow dots). In 4a (scenario 1) the inner ring pumps 75 percent of the fotal water pumped and the outer ring pumps the remaining 25 percent; in 4b (scenario 2) the outer ring pumps 75 percent of the total water pumped and the inner ring pumps the remaining 25 percent. As shown, if the outer rings are required to supply 75 percent of the total water, there will be increased drawdown in the areas near the wells. There is much less drawdown from pumping the inner ring of wells because the water primarily is derived from the Yahara lakes (a relatively large source of water).

#### How this regional model has been applied to smaller site investigations

The Dane County ground-water-flow model is suitable for use as a tool for regional water management. but because of its regional focus, the model should not be used for site-specific simulation. However, the model provides a valuable framework within which site-specific studies can be carried out. The following are examples of ongoing site-specific studies that have made use of the Dane County model.

Pheasant Branch Watershed - The Dane County model was used for a smaller-scale ground-water/ surface-water modeling study done by the U.S. Geological Survey, in cooperation with the City of Middleton and the Wisconsin Department of Natural Resources. The study focused on the effects of urbanization on streamflows and spring flows (Hunt and Steuer, 2000; Hunt and others, 2001; Steuer and Hunt, 2001), and the models are now part of a large watershed-scale project conducted by the Wisconsin Department of Natural Resources, University of Wisconsin -- Madison, Wisconsin Geological and Natural History Survey, and U.S. Geological Survey.

Nine Springs Watershed - The Nine Springs watershed, located just south of the City of Madison (fig. (a), contains an unusually large concentration of cold-water springs and associated wetlands. The Dane County model was used as a starting point for the construction of a detailed inset model to investigate these springs and to determine the effects nearby land-use changes may have on the springs and wetlands (Swanson, 2001). Model simulations helped quantify anticipated reductions in spring discharge resulting from nearby ground-water withdrawals and simulated the land-surface area contributing recharge to the springs. This information is critical for making land-use decisions to protect the quality and quantity of spring discharge.

Fish and Crystal Lakes - Elevation of the stage of Fish and Crystal Lakes, located in northwestern Dane County (fig. 1a), has increased 9 feet since 1966 and caused flooding of some near-shore residences. By using the Dane County model as a starting point, a new U.S. Geological Survey computer program that simulates lakes was coupled to a model of the ground-water system and was used to determine that increasing ground-water recharge was responsible for the lake-stage increase. The model was then used to simulate how pumping from Fish Lake would lower the stage of both lakes and how the lake stages would recover when pumping was stopped (Krohelski and others, 2001).

> Swanson, S.K. 2001. Hydrogeologic controls on spring flow near Madison. Wisconsin: Unpublished Ph.D. dissertation, Dept. of Geology and Geophysics, University of Wisconsin-Madison, 436 p.

#### Information

For reformation on this study or on other USGS programs in Wisconsin, confact:

District Chief ಪ.3. Geological Survey 3505 Research Way Middleton, WI 53562 608) 828-9901 ..ttp://wi.water.usgs.gov/ Authors: Randall J. Hunt, Kenneth R. Bradbury, and James T. Kroheiski



#### STREAM CORRIDOR PROTECTION AND MANAGEMENT

#### Stream Eligibility and Designation

Two stream categories were designated for inclusion into this plan, Tier I and Tier II. Streams were categorized using varying sets of criteria based on the designated biological use, current level of protection or enhancement and the likelihood of establishing conservation within the stream corridor.

#### Tier I streams have one or more of the following attributes/designations:

- Coldwater-high value from a biological and recreational standpoint. They support cold-water fish communities, and flow is supplied primarily from spring discharge.
- Streams which have been enhanced or protected through an existing conservation program. Restoration or enhancement programs may include but are not limited to: Priority Watershed Projects, Targeted Resource Management, WDNR Habitat Projects, Natural Resource Conservation Service, and other non-profit or conservation organization work. Most if not all have existing easements on them. Priority may be given to those streams/segments where easements have expired or will expire soon.
- Streams which have been identified under the 303(d) designation resulting from non point source pollution or habitat degradation.
- Streams classified as Outstanding Water Resources (OWR) or Exceptional Water Resources (EWR) by WDNR.
- Streams identified as sensitive in the Dane County Water Body Classification Study
- Streams within the boundary of an approved Dane County Resource Protection Area Plan.

#### Tier II streams have one or more of the following attributes/designations:

- Warm water streams that may exhibit a sensitivity to development or have the ability to be restored or enhanced through management actions.
- Streams within the boundary of an approved Dane County Resource Protection Area Plan.
- · Streams identified in WDNR Basin Plans with "high" or "medium" designations for habitat improvement.

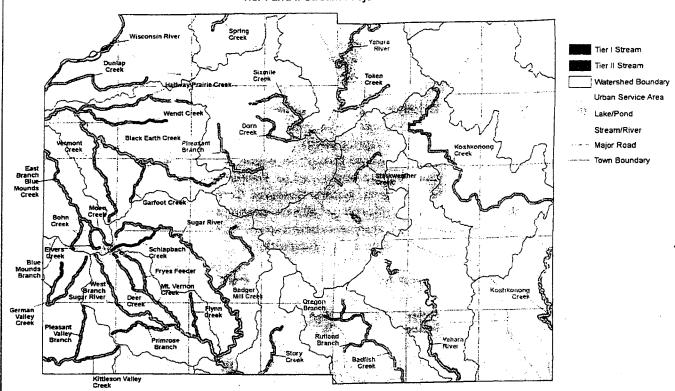
#### Program Implementation

Priorities for implementation will consider varying factors, including whether streams have protection plans in place, financial commitments from the local municipality or qualified non-profit organization and the recommendation of the Dane County Land and Water Resources Department and respective Divisions. In cases where opportunities arise and there is no protection plan approved, an evaluation will be conducted to determine the resource being protected, fiscal resources available for both purchase and implementation and the potential for future protection efforts. Dane County would take more of a leadership role in restoration efforts and landowner contacts on Tier I streams, while non-profits and local units of government would be expected to work on Tier II streams, with Dane County providing financial assistance through the Conservation Grant Fund program.

In addition to biological considerations, the County should investigate increasing public fishing access through acquisition of permanent easements on these streams. Dane County should work with local non-profit groups such as Trout Unlimited and the Dane County Conservation League, to identify which streams offer the highest fishing potential and would benefit from increased public access.

Figure 14

Tier I and II Stream Project Areas



#### Tier I Streams

- Black Earth
- Bohn
- Deer
- Dunlap
- Elvers
- Flynn
- Fryes Feeder
- Garfoot
- German Valley
- Gordon
- Halfway Prairie
- Kittleson Valley •

- Moen
- Mt. Vernon
- Pleasant Valley
- Primrose Branch
- Schlapbach
- Spring
- Sugar
- Token
- Vermont
- · (C)
- Wendt
- West Branch Blue MoundsWest Branch Sugar
- Wisconsin

#### Tier II Streams

- Badfish
- Badger Mill
- Dorn
- Koshkonong
- Oregon Branch Badfish
- Pheasant Branch
- Rutland Branch Badfish
- Sixmile
- Starkweather
- Story
- Yahara

Welcome to the final Public Informational Meeting for the Northeast Neighborhood. The focus of the open house will be the entire draft Land Use Plan including the text and background information as well as land uses and the corresponding land use map. The meeting will begin with an introductory open house followed by brief presentations on both the Storm Water Management Plan and draft Land Use Plan. After the presentations conclude, the open house segment of the meeting will resume for everyone to have an opportunity to discuss the plan one-on-one with the planners from Ruekert/Mielke.

Following the Public Informational Meeting, the next step is to present the Northeast Neighborhood Land Use Plan to the Plan Commission. We will forward all written comments to the Plan Commission for consideration. Please use this comment form to write down comments or concerns that you may have regarding the Northeast Neighborhood. Your comments are very important to us. Please leave the form at the end of the meeting or send it by folding the form in thirds to the address provided by Friday, July 20, 2007. Thank you for taking the time to share your comments and concerns for the Northeast Neighborhood. Please attach additional sheets of paper if needed.

STORM WATER MANAGEMENT PLAN LAND USE PLAN If you have any other questions or comments please contact Bruce Kaniewski at Address: bkaniewski@ruekert-mielke.com Email:

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bkaniewski@ruekert-mielke.com

Welcome to the final Public Informational Meeting for the Northeast Neighborhood. The focus of the open house will be the entire draft Land Use Plan including the text and background information as well as land uses and the corresponding land use map. The meeting will begin with an introductory open house followed by brief presentations on both the Storm Water Management Plan and draft Land Use Plan. After the presentations conclude, the open house segment of the meeting will resume for everyone to have an opportunity to discuss the plan one-on-one with the planners from Ruekert/Mielke.

Following the Public Informational Meeting, the next step is to present the Northeast Neighborhood Land Use Plan to the Plan Commission. We will forward all written comments to the Plan Commission for consideration. Please use this comment form to write down comments or concerns that you may have regarding the Northeast Neighborhood. Your comments are very important to us. Please leave the form at the end of the meeting or send it by folding the form in thirds to the address provided by Friday, July 20, 2007. Thank you for taking the time to share your comments and concerns for the Northeast Neighborhood. Please attach additional sheets of paper if needed.

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Fmail: media Ackalia ust	bkaniewski@ruekert-mielke.com	

Statement to the Plan Commission and Ruekert-Mielke on July 12, 2007

My name is Phyllis Hasbrouck, and I'm the chair of the West Waubesa Preservation Coalition. We are in favor of preserving farmland, preserving and improving the quality of Lake Waubesa, its wetlands and tributary streams, of creating a dense city core near Fitchburg's City Hall, promoting the use of trains and buses instead of cars, and of helping farmers stay on the land, make a decent living, and find another farmer to sell their farm to if they want to retire.

We are not in favor of development that proceeds without any assurance that the land and waters nearby won't be harmed. This neighborhood plan and map, and this conceptual storm water plan, for the Northeast Neighborhood, give no such assurances. Dr. Cal DeWitt, professor of environmental sciences at the Gaylord Nelson Institute of the UW Madison, says that this development could damage the lake in several ways, including:

- runoff polluted by gasoline, anti-freeze, lawn pesticides, etc. damaging the plant and animal life downstream, including the Northern Pike hatchery in Swan Creek;
- > floodwaters from all the impervious surfaces causing erosion and silting of Lake Waubesa, which is only 33 ft. deep (if it gets too shallow, wetland plants can take hold and turn the southern end into a wetland.);
- phosphorus from manicured lawns washing downstream and contribute to eutrophication of Lake Waubesa, which means it would become a big stinking mess of algae, with all other life destroyed;
- ➤ the water necessary for 1432 residences and 103 acres of commercial establishments robbing the Waubesa wetlands and the southern half of Lake Waubesa of water, which would also encourage eutrophication;

Given all these unknowns, it would be irresponsible for the city of Fitchburg to approve this or any other development near bodies of water or wetlands. Instead of committing \$8 million to a highway interchange to open up this far corner of Fitchburg, they should spend a much smaller amount on the studies that would show them where and how to develop responsibly.

We urge the citizens of Fitchburg to learn more about this costly and unnecessary development, and to tell their leaders that they expect them to be better stewards of our land, water, and money! People can visit our website at <a href="https://www.westwaubesa.org">www.westwaubesa.org</a>, or call us at 223-9571. Thank you.

Phyllis Hasbrouck, 3113 View Rd., Dunn, WI 53711 phyllis@terracom.net



4725 NORA LN. MADISON, WIS. 53711-5944

608-222-6489

JUL 1 0 2007

Fitchburg Planning Commission-

#### Gentleman:

I'm concerned about the proposed Northeast Neighborhoon development, just West of Larsen Rd. I live 4 houses East of Fitchburg line.

One concern is the amount of ground water that will be pumped out of the ground.

Another Concern is the amount of storm water runoff that would come down from that area With 211 the houses, streets, other paving.

Also concerned with the increased traffic that would be chokeing the area.

Why has Fitch burz decided to jump empty areas, instead of building from the center outward ?

Sincerely, JSOng

From:

"Kuehner, Vanessa" <VKuehner@ruekert-mielke.com>

To:

"Thomas Hovel" <Thomas.Hovel@city.fitchburg.wi.us>

Date:

7/12/2007 2:48 PM

Subject:

NEN: Citizen comment - Czarapata

Citizen comment - #3 of 3

----Original Message-----

From: emma czarapata [mailto:keepintouch54162@yahoo.com]

Sent: Wednesday, July 11, 2007 12:22 PM

To: Kaniewski, Bruce

Subject: developing Northeast neigborhood

I am writing about the plan to develop the Northeast neighborhood. There are lots of reasons to rethink jumping so far away from Fitchburg to plan such dense housing. I will concentrate on a couple:

It will cost a lot for the infrastructure needed to build houses. Fitchburg residents will pay for that. What about added fire and police protection? There is a cost for that. Since people in this neighborhood will probably shop in Madison or Monona, taxpayers in Fitchburg would not be benefiting from this neighborhood after they pay for costly roads, sewer and water infrastructure. Money would not stay in Fitchburg. Economically, it would be an overall drain for Fitchburg.

We need to look at the big picture to see if developing so much land is necessary. What happens if development continues it's present trend and there is little or no demand for houses. Madison is seeing unsold condos and a buyers market with houses staying on the market a long time. Often they are finally sold with much accommodation from the sellers. Oregon has a moratorium on putting in roads because of a lack of home building. Why would this area be any different?

This area is close to the E-way and houses lots of animals. Where will they go? We are constantly encroaching on their living space. It makes sense to leave this wild.

There are other alternatives. Already, the Hmong association has rented land for gardens. What if they were to use the land already tilled, plus encouraging more gardening? What if other organizations would rent some land for gardens. It would help the economy of Fitchburg. I could see vegetable farmers selling goods at the Fitchburg farmer's market and buying supplies there.

Thank you for your time,

Emma Czarapata 3106 Larsen Rd Madison, WI 53711 223-0802